



# Australian Bureau of Statistics

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### Feature Article - Easter Holiday Effects in Retail Turnover

#### INTRODUCTION

In Australia, the observance of Easter as a public holiday generally occurs in April, but on occasions can be observed completely in March, and more rarely straddles the end of March and the start of April. This article examines the influence of the timing of the Easter public holidays on the Retail Turnover data for March and April.

Using available historical data for Retail Turnover, this article concludes that when Easter has fallen well into March or well into April, there is little discernable effect due to Easter over and above normal seasonal patterns. It appears that at the overall level, increased retail activity before Easter was balanced by a lull during and/or after the holiday period. However, when Easter fell late in March or early in April (as occurred this year), there is historical evidence to suggest that the seasonally adjusted March data tended to be higher than would otherwise have been expected, and the seasonally adjusted April data tended to be lower than expected. There is insufficient data, however, to reliably quantify this effect.

#### EASTER EFFECTS

The seasonal adjustment procedures used by the ABS include tests to see if moving holidays, like Easter, are distorting the normal seasonal patterns of the retail turnover data series. A simple Easter holiday effect would manifest itself as (say) higher retail activity than otherwise expected in March or April, depending on where Easter fell. If a 'moving holiday effect' was detected, the seasonal adjustment process would remove the Easter effect from the March or April seasonally adjusted data, as appropriate each year. However, this type of behaviour is not apparent in the Retail Turnover Series, and so no explicit moving holiday adjustment is made during the seasonal adjustment of these series.

Nonetheless, it is thought that normal spending patterns near Easter might still be disrupted by higher than normal spending prior to Easter and lower than normal spending on the public holidays associated with Easter (particularly Good Friday), and over the following period. When Easter falls deep in March, or deep in April, these effects apparently net out. But there might still be an Easter holiday effect whenever the public holidays fall very early in April, or straddle the end of March and the start of April. In this case, the activity preceding the Easter holiday might increase the Retail Turnover data for March over and above the normally expected seasonal behaviours, and the corresponding lull during and/or after the holidays might decrease the April figures below normal seasonal patterns. An effect which only occurs when Easter falls close to the March/April boundary has been called an 'Easter holiday proximity effect'. There is no allowance for an Easter holiday proximity effect in the ABS's seasonal adjustments for the Retail Turnover series.

#### DATA AVAILABILITY

Detecting, and quantifying a potential Easter holiday proximity effect is difficult because there are only a few observations of Easters starting in the first week of April. Furthermore, most of the past observations are old and may be less relevant for identifying an effect over recent years. This year will be the first observation of an Easter starting on 2 April in the span of data available.

The longest data span examined in this article is April 1962 to January 1999, for Total Retail Turnover in Australia. For all other series considered (those by State and by major industry) the available data span is shorter, April 1982 to January 1999.

In 1983, 1988 and 1994, Easter started on 1 April. In these years the seasonally adjusted Total Retail Turnover activity in March appeared to be consistently larger, and activity in April appeared lower, than would otherwise have been expected. This provides support for the idea of an Easter holiday proximity effect.

This year Easter starts on 2 April 1999, and it is of interest whether an experience similar to Easter starting on 1 April will be observed again. However, this is the first observation of an Easter starting on 2 April in the span of data available. The next 2 April occurrence is in 2010.

Other occurrences of Easter starting in the first week of April have been Easter starting on 4 April in 1969 and 1980, and 5 April in 1985 and 1996. Easters starting on 3 April, 6 April or 7 April have not been observed in the available data span. For the more detailed series considered in this article, Easters starting on 4 April have not occurred in the available data span (April 1982 to January 1999).

It has also been suggested that there may be an Easter holiday proximity effect for very late March Easters when part of the Easter holiday falls in April. In 1972, Easter started on 31 March and in 1991, Easter started on 29 March.

The table below shows the dates on which Easter starts between March 28 and April 7 for the period 1962 to 2010. Appendix 1 contains the starting dates for all Easters between 1962 and 2010.

Dates on which Easter starts between March 28 and April 7 for the period 1962 to 2010:

<b>Easter Friday</b>	<b>Year</b>
28 March	1975, 1986, 1997
29 March	1991, 2002
30 March	None
31 March	1972
1 April	1983, 1988, 1994
2 April	1999, 2010
3 April	None
4 April	1969, 1980
5 April	1985, 1996
6 April	2007
7 April	None

## **METHOD AND INTERPRETATION OF CHARTS**

Because of the limited amount of data available for analysis from occasions when Easter has fallen near the end of March, or in early April, sophisticated techniques to investigate and quantify a potential Easter holiday proximity effect are not applicable. Instead, this article presents some graphical evidence to enable readers to make their own assessment of any systematic proximity effect on retail turnover data associated with

Easter falling late in March, or early in April.

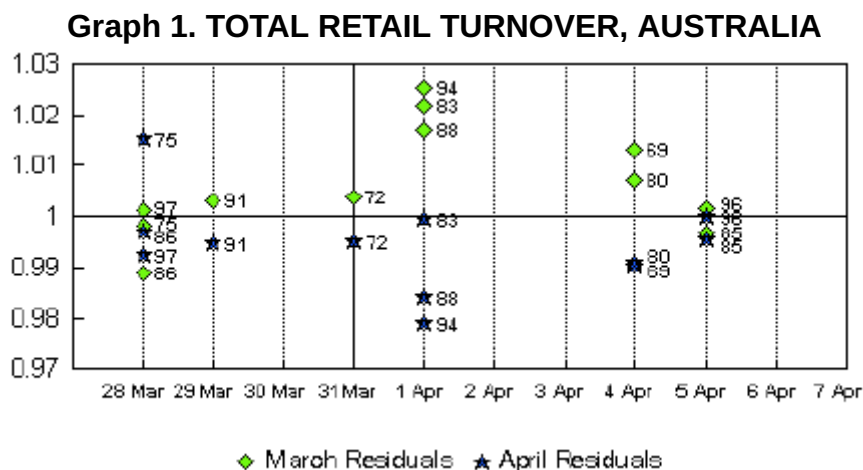
The original retail turnover data series is decomposed by the seasonal adjustment process into three components, namely the seasonal factors, the trend and the residual/irregulars. Neither the seasonal factors or the trend would reflect the Easter holiday effect. Hence, any Easter holiday effect would remain in the residual/irregular component of the series. Therefore, if there is a systematic Easter holiday effect operating in the series, it will show up as a pattern in the residuals about the trend estimates of the seasonally adjusted series.

In this article the residuals have been derived by dividing the seasonally adjusted series by the trend. This provides a (multiplicative) measure of any residual/irregular effect in the seasonally adjusted series. This approach is consistent with the conventional use of multiplicative seasonal adjustment factors for these series.

Provided sufficient observations are available, examining charts of these residuals could enable a visual assessment of whether a systematic Easter holiday effect is present. Available data has been plotted for all Easters that have occurred between March 28 and April 7. The bottom axis of the graph shows the dates on which the Easter holiday began (Good Friday), and each point on the graph represents the residual for March or April for a particular year. If the residuals are scattered in a random fashion about the benchmark neutral line of unity, the interpretation would be that there is no systematic Easter holiday effect. This is because after removing the trend from the seasonally adjusted series only irregularity would then remain, oscillating randomly about its expected value of unity, as it should. However, if the residuals for a particular month are consistently above or below the benchmark neutral line, then that would provide evidence of a systematic Easter holiday effect. It would also allow assessment as to whether the effect changes over time as the starting date of Easter moves closer to the end of March/start of April.

## EASTER HOLIDAY PROXIMITY EFFECTS IN RETAIL TURNOVER

The chart below illustrates graphically how few observations of Easter starting in the period March 28 to April 7 there were over the last 37 years. Only four observations have occurred in this decade, namely 28 March 1997, 29 March 1991, 1 April 1994 and 5 April 1996. As well as a shortage of data points, there is also the issue that any effect may have been changing over recent years because of, among other things, retail purchasing patterns changing with deregulation of trading activity. Therefore, observations earlier than the present decade may not be pertinent to 1999 Easter's activity.



This chart shows Total Retail Turnover in Australia over the available data span April 1962 to January 1999. Appendix 2 presents 16 more charts, for States/Territories, and major industries to

enable readers to make their own assessment of whether April Easters that are close to the end of March have a systematic effect on retail turnover activity in March and April.

It would seem from the charts that in the past when Easter starts on or after 5 April, there is no evidence of a systematic Easter holiday proximity effect; the residuals for March and April are randomly distributed about the neutral benchmark line. Similarly, when the Easter holiday has begun on or before 28 March, the residuals are also randomly distributed about the neutral line. Examining the historical data for Easters which fell earlier into March, or later into April (not shown on the graph above) confirms that there is no simple 'moving holiday Easter effect'.

However, when Easter has started on 1 April the ratios for March are consistently above the neutral benchmark line, and those for April are below the neutral line, although not always by the same amount. This also appears to be the case in Total Retail Turnover for Australia when Easter started on 4 April, but not to the same extent. In this case the two observations are quite dated at 1969 and 1980. This seems to suggest that there may be an Easter holiday proximity effect. However, conclusions based on so few observations are tenuous.

When Easter starts in late March, there appears to be a slight Easter holiday proximity effect in 1972 and 1991.

If there is an Easter holiday proximity effect, it is likely that the seasonally adjusted Retail Turnover estimates will be higher than would otherwise be expected in March 1999, and lower than would otherwise be expected in April 1999. Given the dated nature of the evidence for 4 April, little information is available on the rate of decay of the effect as the date on which Good Friday falls moves into April. This makes it very difficult to predict the magnitude of any Easter holiday proximity effect. From visual inspection of the charts, it appears that if they were used to approximate the size of an effect, it is unlikely to be more than of the order of 1 to 1.5%, i.e. the figure for March 1999 would be approximately 1 to 1.5% higher than expected based on normal seasonal factors, with the seasonally adjusted figure for April 1999 a similar percentage lower than expected.

Research to empirically quantify the Easter holiday proximity effect is continuing. This research is likely to be relevant for 2002 when Good Friday falls on March 29. Analysts wishing to discount any Easter holiday proximity effect or other irregular behaviours in the seasonally adjusted series are advised to analyse the trend estimates.

## FOR FURTHER INFORMATION

For further information regarding this article contact the Supervisor, Time Series Analysis section, ABS on 02 6252 6345.

## APPENDIX 1. START DATES FOR THE EASTER HOLIDAY, 1962 TO 2010

Easter Friday		Year
March	20	none
	21	2008
	22	none
	23	none
	24	1967, 1978, 1989
	25	2005
	26	none

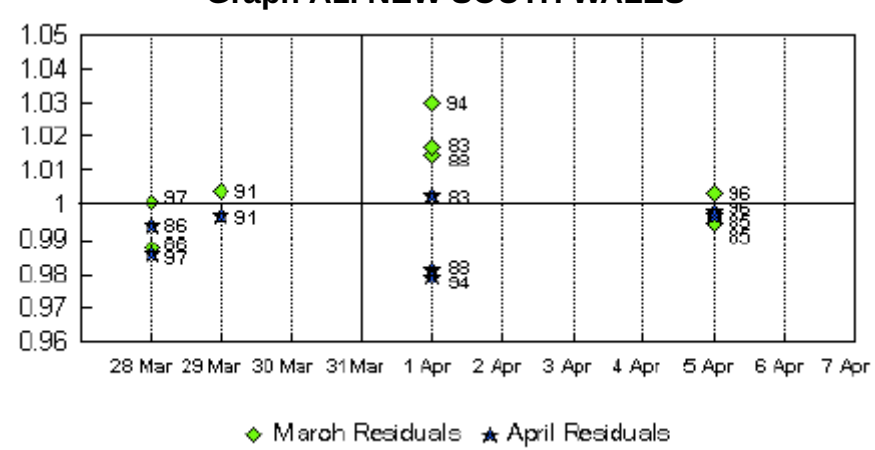
April	27	1964, 1970
	28	1975, 1986, 1997
	29	1991, 2002
	30	None
	31	1972
	1	1983, 1988, 1994
	2	1999, 2010
	3	None
	4	1969, 1980
	5	1985, 1996
	6	2007
	7	None
	8	1966, 1977
	9	1971, 1982, 1993, 2004
	10	1998, 2009
	11	None
	12	1963, 1968, 1974
	13	1979, 1990, 2001
	14	1995, 2006
	15	None
	16	1965, 1976
	17	1981, 1987, 1992
	18	2003
	19	None
	20	1962, 1973, 1984
	21	2000

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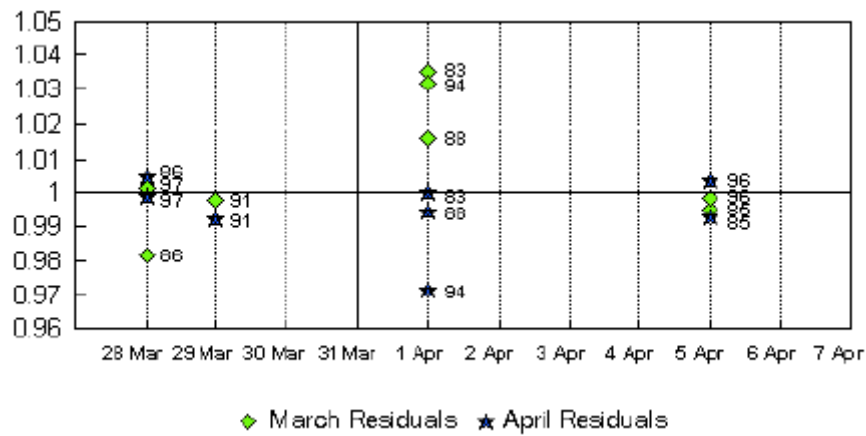
## APPENDIX 2. CHARTS SHOWING MARCH AND APRIL RESIDUALS FOR RETAIL TURNOVER

### States and Territories

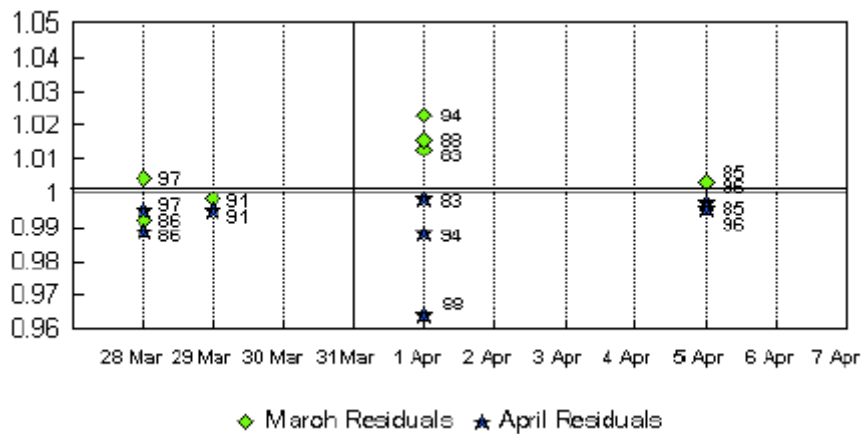
Graph A1. NEW SOUTH WALES



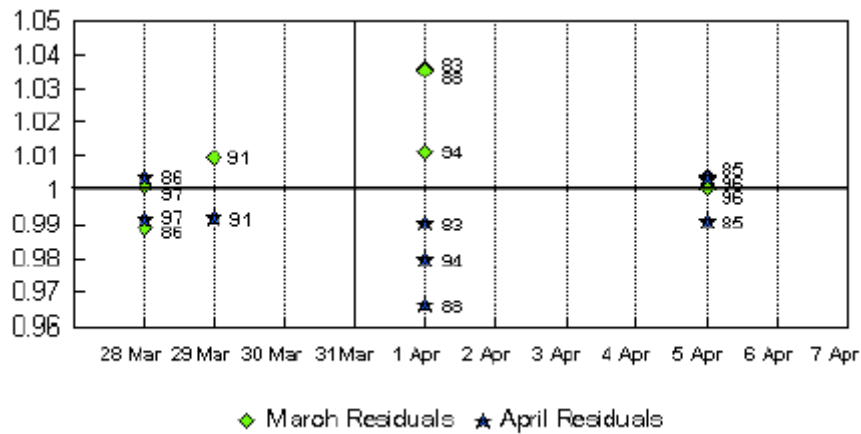
Graph A2. VICTORIA



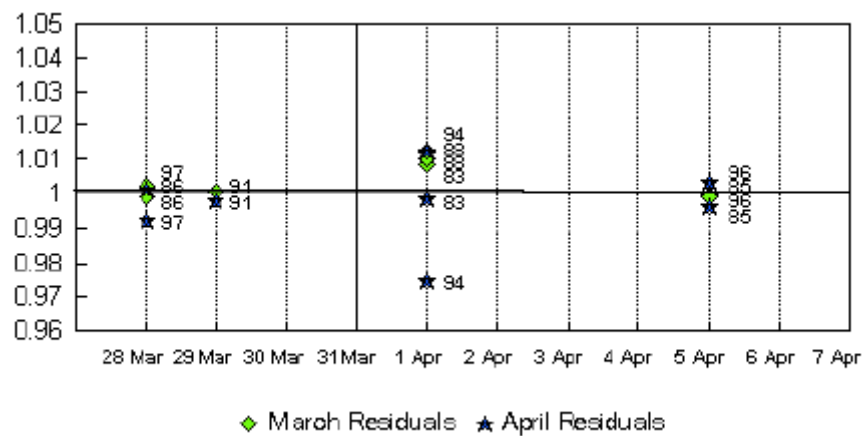
**Graph A3. QUEENSLAND**



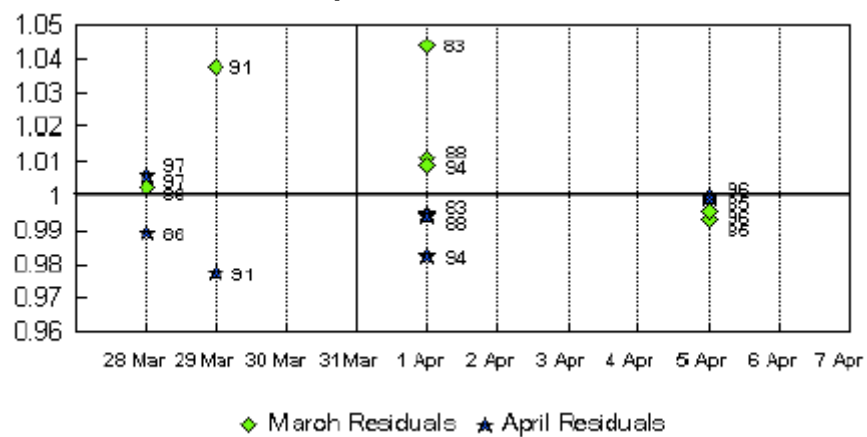
**Graph A4. SOUTH AUSTRALIA**



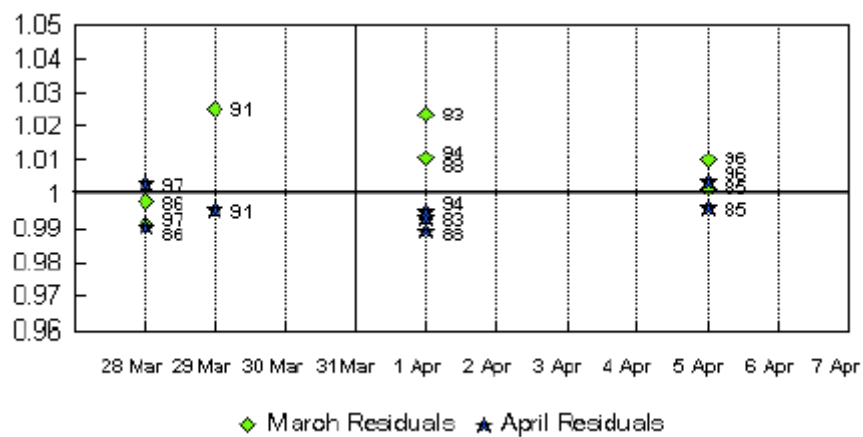
**Graph A5. WESTERN AUSTRALIA**



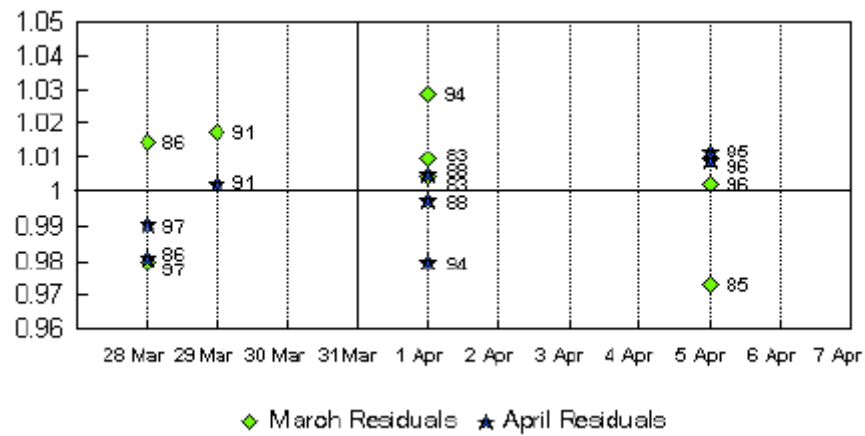
**Graph A6. TASMANIA**



**Graph A7. NORTHERN TERRITORY**

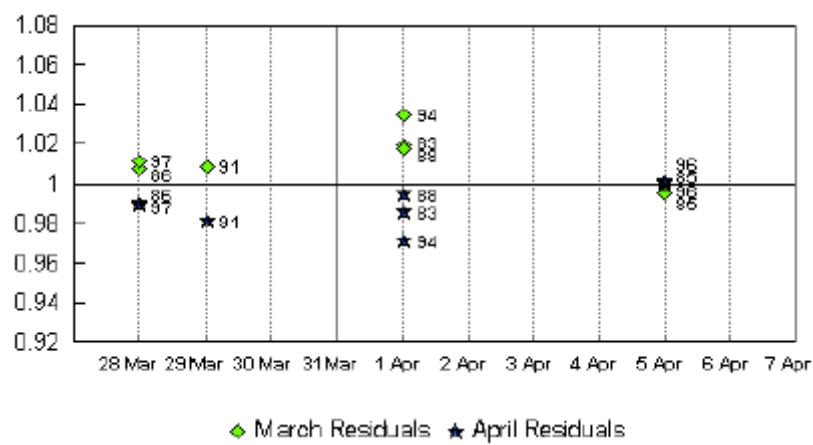


**Graph A8. AUSTRALIAN CAPITAL TERRITORY**

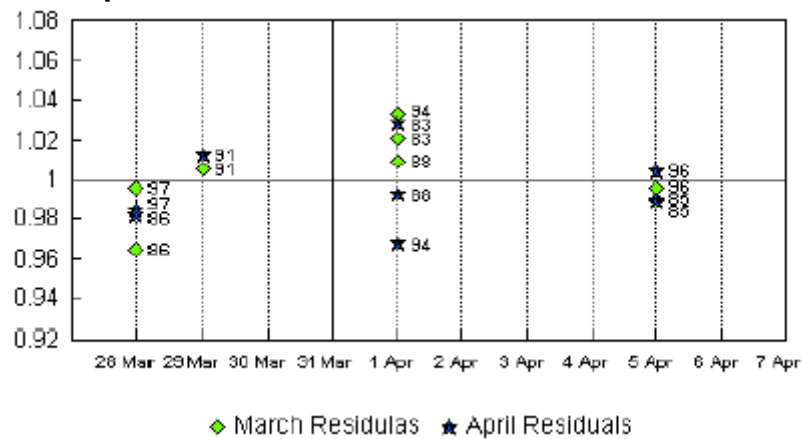


## Industry Groups

**Graph A9. FOOD RETAILING AUSTRALIA**

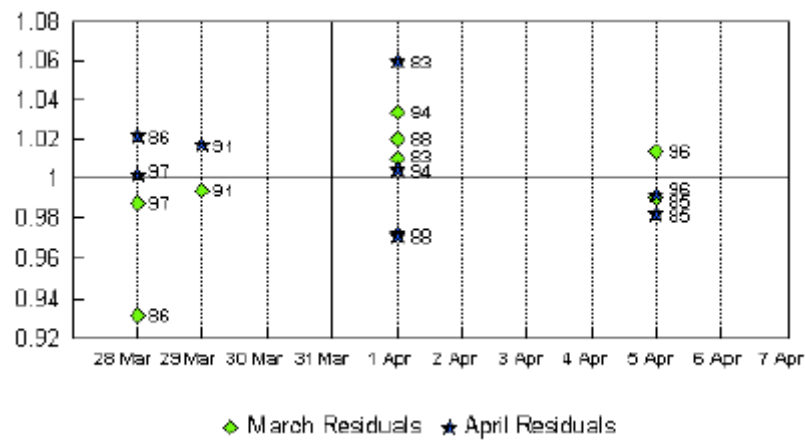


**Graph A10. DEPARTMENT STORES, AUSTRALIA**

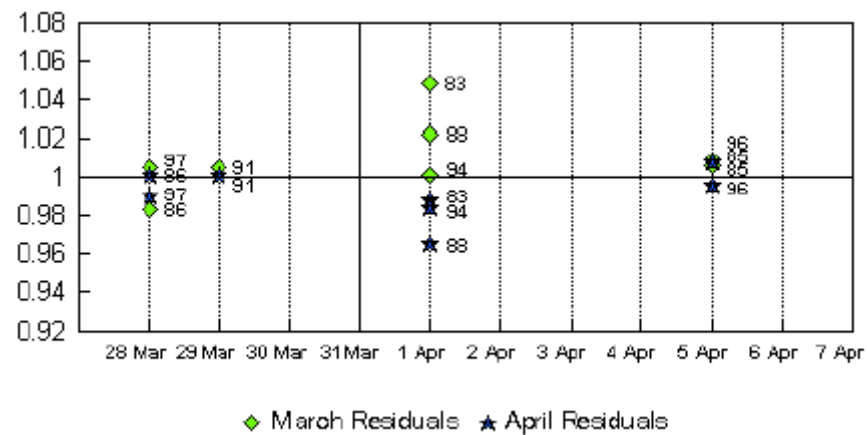


**Graph A11. CLOTHING AND SOFT GOOD RETAILING, AUSTRALIA**

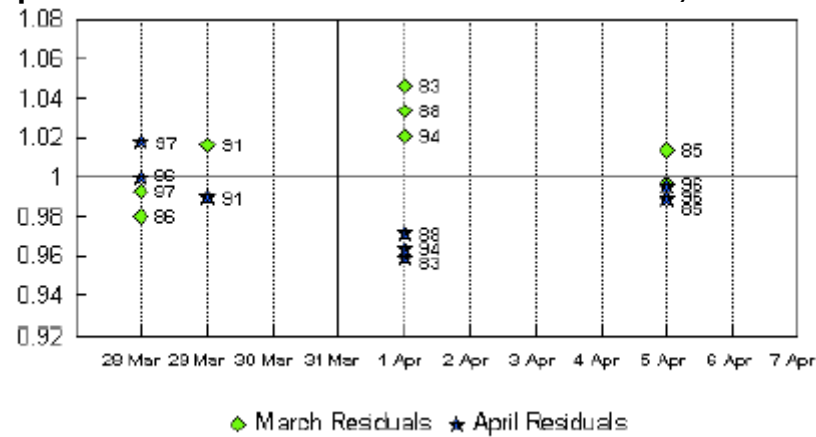




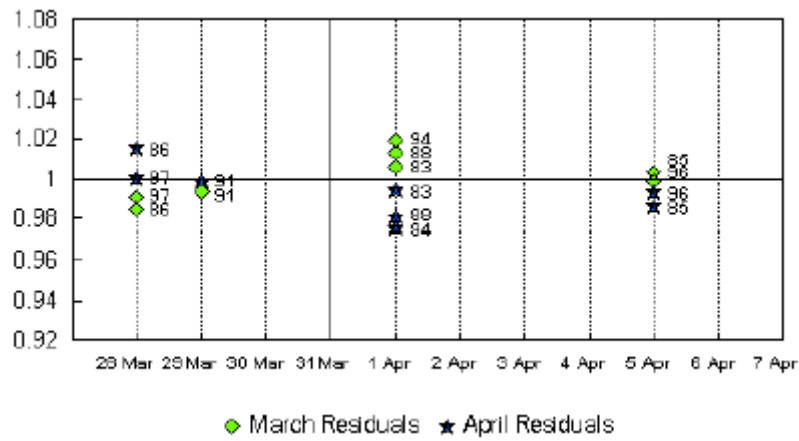
**Graph A12. HOUSEHOLD GOOD RETAILING, AUSTRALIA**



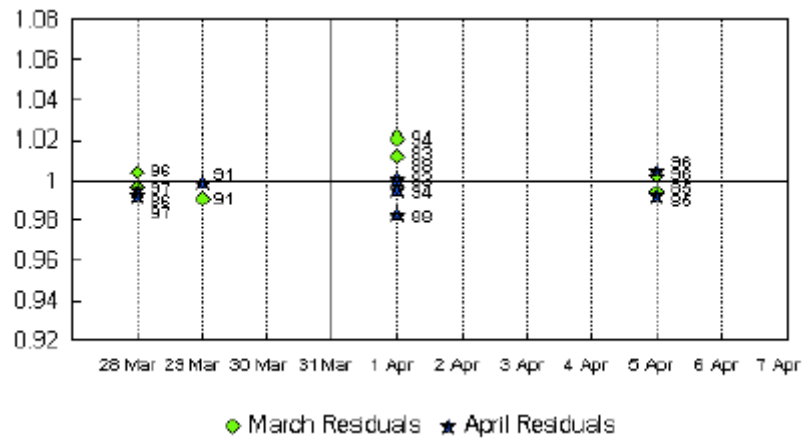
**Graph A13. RECREATIONAL GOOD RETAILING, AUSTRALIA**



**Graph A14. OTHER RETAILING, AUSTRALIA**



**Graph A15. HOSPITALITY AND SERVICES, AUSTRALIA**



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